

STCG Subcon Subgroup Meeting Minutes

January 12, 2000

Introductions/Announcements (Arlene Tortoso)

Arlene opened the meeting and introductions were made. She mentioned that the N-Springs ITRD meeting was rescheduled for February 9-10 in the Bechtel Building's Assembly Room. There will probably be a site tour on the morning of February 9. The Carbon Tet ITRD meeting is scheduled for March 8 (Bechtel Building Assembly Room) and March 9 (EESB Snoqualmie Room at PNNL).

Jim Hanson told the Subgroup that Debbie Trader made a presentation on the STCG to the DOE-RL Site Management Board on January 10. The presentation covered the STCG membership, purpose, benefits, issues, options, and recommendations. Debbie's presentation is attached. The final recommendation was to increase the emphasis on the Subgroups, hold quarterly technology meetings of the Management Council, and have the Deputy Manager for Site Transition (Harry Boston) chair the STCG.

Jim also announced a couple of changes in DOE-RL's Science and Technology Programs (STP) Division. Shannon Saget left DOE and took a job in Kona, Hawaii teaching high school math. Craig Richins is on assignment to DOE-RL's Integrated Safety Management System.

The Groundwater/Vadose Zone Integration Project Advanced Vadose Zone Characterization Workshop will be held in Richland on January 19-20, 2000. It will include representatives from industry and the national laboratories as well as the new EMSP award winners.

Review Minutes from Last Meeting (Facilitator)

The facilitator reviewed the minutes from the December 7, 1999 meeting. Judit German-Heins requested a change in the section on the Sr-90 ITRD Project Status. As a result, the statement saying that the Nez Perce Tribe is opposed to the permeable barrier wall technology was removed. The minutes were approved subject to this one change.

National STCG Meeting (Jim Hanson)

Jim attended the National STCG meeting held by Mike Barainca in Las Vegas on October 25, 1999. The main topic was how the Focus Areas are going to demonstrate that they are successful. The meeting participants proposed three criteria to rate the Focus Areas; these will be goals for the Focus Areas to try to meet.

1. Fifty percent of the 100 technology deployments expected this year will be EM-50 technologies.

2. Ten EMSP projects will be brought into SCFA (e.g., ISRM). But there is a quandary because the Focus Areas are currently lacking in applied science programs.
3. Technical assistance programs (ITRD, Lead Lab) will handle 100 requests for technical assistance.

Hanford's EM Corporate Performance Measures input is currently on hold at DOE-HQ.

There is an EMSP call for renewal of the old awards based on merit and relevance to site needs.

Jim also reported on an SCFA User Steering Group (USG) meeting that he attended. This group is chaired by Rick Nace, who reports to John Lehr. SCFA wanted to know how they should interface with the USG. A schedule went out to BHI and PNNL to make sure Hanford is involved in SCFA's S&T needs prioritization process.

TIE Workshop (Jim Hanson)

Abdul Dada has the proceedings of this workshop if anyone wants a copy. Hanford had some Groundwater/Vadose Zone presentations by Terri Stewart on the agenda.

Weekly Conference Calls with SCFA (Jim Hanson)

These calls are every Monday morning. Currently, Jim Hanson, Abdul Dada, and Bill Bonner participate from Hanford. SCFA sends out the agenda in advance. They are trying to gather highlights from the sites, looking for 100 technology deployments, and encouraging the sites to use the weekly calls to raise issues. The SCFA Mid-Year Review will be held in Albuquerque in March.

Plans for FY01 S&T Needs Process (Jim Hanson)

DOE-RL is just starting to kick off this process. Schedules are being developed now. We will hear more about it at future Subgroup meetings.

Mark Freshley met with Mike Truex last week to discuss BHI support to the S&T Roadmap process. S&T needs are included in the S&T Roadmap document. This year they plan to add the Risk technical element. Currently they are updating the old S&T needs, but they also need to add more carbon tetrachloride needs. They mapped the new EMSP projects into the Roadmap, and BHI is now looking at long-term needs. The Roadmap must be revised by late March or early April. More details will be presented to the Subgroup in the near future.

Upcoming SCFA Call for Proposals (Bill Bonner)

The call is expected in mid-February (or perhaps a little later) for FY 2001. We don't know what the subject is yet, although phytoremediation and barriers were suggested as possibilities. Jim Hanson stated that Rick Nace's conference call should address this.

Phytoremediation Workshop Outcomes (Cal Ainsworth)

Cal Ainsworth, John Fruchter, and Dib Goswami attended this workshop on Phytoremediation of Inorganic Contaminants at Argonne National Laboratory. Phytoremediation is defined as the use of plants to remove or stabilize contaminants in soil and groundwater. It is a managed, defined remediation technique in which plants or integrated plant/rhizosphere systems are employed to reduce the amounts of biologically available soil contaminants to regulatory acceptable levels. The workshop report is due to DOE-Savannah River by the end of January.

The purpose of the workshop was to evaluate four primary areas of phytoremediation:

- Phytoextraction – the use of plants to remove contaminants from soils
- Rhizofiltration – the use of plants to remove contaminants from polluted waters
- Phytostabilization – the use of plants to eliminate or minimize the bioavailability of contaminants in soils
- Monitoring

The workshop objectives were to:

- Determine the current status (stage of development), commercial viability, and regulatory acceptance of the four types of phytoremediation
- Identify any research gaps and assess the potential for success
- Develop recommendations for future work

Phytoextraction is the most mature of the phytoremediation technologies, and it has good regulatory acceptance. However, the disposition of the accumulated biomass can pose problems (e.g., low-temperature ashing). Phytostabilization is the least advanced of the technologies.

Phytoremediation technologies work when the contaminants to be removed are at depths of 1-2 meters. Argonne National laboratory is looking at removal of trichloroethylene and tritium at depths of 25-40 feet, with encouraging results. They are using poplars that are buried and sealed, which forces their roots down.

For any phytoremediation technology, it is necessary to match the plants to be used with the specific site details (location, soil type, contaminants, depth). In wetlands areas, phytoremediation is used as a flow-through treatment for abandoned mining sites. It is also used as a tertiary treatment in some community water treatment systems.

Overall, phytoextraction is seen as definitely viable and acceptable. Certain plant species have developed in soils that exhibit potentially toxic concentrations of heavy metals. Evolutionary

stress has caused them to devise ways to survive in these soils. Plant uptake (the basis for phytoextraction) has been demonstrated in the field for a number of heavy metals. Other applied research is proceeding at the bench- or pilot-scale, in which basic researchers are studying membrane transport, genetic manipulation, etc.

The major issue with phytostabilization is long-term stewardship. Physical stabilization for erosion control is a well-known technique. It is useful in areas where contaminants have been stabilized in place and the site presents limited risks. Chemical stabilization is currently being used in conjunction with other technologies, but is not viable on its own. Biogeochemistry is complicated and not well understood. An action directed at one contaminant may affect the mobility of another. Chemical stabilization without removal of the radionuclides is not viable for the Hanford Site.

Rhizofiltration and hydrologic control is applicable to groundwater cleanup and is viable under certain conditions. It has been demonstrated and applied on organic compounds, ammonia, and nitrate. It has also been demonstrated and applied to surface water impoundments. However, there is limited understanding of the relationship between water utilization and uptake. The technology could be applicable for metals and radionuclides under certain conditions, but would require extensive pretreatment testing.

The use of plants to monitor the environment is historically very common (bioprospecting). For a plant to be effective at monitoring, it must see the contaminant, be able to take the contaminant up, and be able to translocate the contaminant to an available portion of the plant. Currently, we cannot relate the plant's contaminant concentration to the soil/water concentration.

Status Report on Selected S&T Needs (Scott Petersen)

Scott reported that the Federal Energy Technology Center (FETC) has changed its name to the National Energy Technology Laboratory (NETL). They are thinking about doing a cone penetrometer demonstration at Hanford this spring. Test pits are being used to look for chromium in the vadose zone to site the boreholes to go in during early February at the 100-DR site. The water treatment plant was the source of the chromium in this area. A Treatability Test Plan for In Situ Gaseous Reduction is currently being developed, including a Sampling and Analysis Plan. It should be ready for review on February 1. Gas injection is six months away.

Scott distributed the following handouts. In the future, we will try to send these out two weeks in advance of the Subgroup meeting.

- Internal Priority of FY2000 Subsurface Contaminants Technology Needs
- ER Project Technology Need Status Report for RL-SS01 (In Situ Remediation of Carbon Tetrachloride)
- ER Project Technology Need Status Report for RL-SS04 (In Situ Remediation of Chromium in Groundwater)
- ER Project Technology Need Status Report for RL-SS07 (In Situ Remediation of

Strontium-90 in Groundwater)

- Summary of Activities for December 1999

BHI Technology Applications prioritized the technology needs in conjunction with the ER projects. Their priorities were as follows:

- 1 = Groundwater remediation mainly, plus burial grounds
- 2 = Soil remediation and characterization
- 3 = In situ, in-line detection needs

Scott agreed to look at how to bin the remediation needs into the groundwater/vadoze zone structure.

In Situ Redox Manipulation (ISRM) is the preferred technology for remediation of chromium in groundwater. However, RL-SS04 is kept open in case we find a more cost-effective method for other sites (e.g., bioremediation). Arlene also mentioned that DOE would be ready to close out the Sr-90 ITRD Project by the end of this fiscal year.

Endorsement of Subcon Subgroup FY99 Annual Report to the Management Council

The Subgroup endorsed the FY99 Annual Report. It will be provided to the Management Council at their next meeting.

Action Items

1. Modify December 7 meeting minutes and reissue them (Facilitator). Done.
2. Update STCG web page and advertise it again (Facilitator).
3. Ask Dennis Brown to develop a list of Planning and Integration staff who will be assigned to the STCG Subgroups and the Focus Area User Steering Groups (Jim Hanson).
4. Distribute agenda for the Groundwater/Vadose Zone Integration Project Advanced Vadose Zone Characterization Workshop on January 19-20 (Jim Hanson/Facilitator). Done.
5. Add DOE-ORP representatives (Joe Cruz, Tony Knepp, and Rob Yasek) to the Subgroup distribution list (Facilitator). Done.
6. Present updated version of Groundwater/Vadose Zone S&T Roadmap to the Subgroup in February or March (Mark Freshley).
7. Forward handouts from this meeting to Gordon Rogers (Facilitator). Done.

Attendees

Cal Ainsworth (PNNL)
Bill Bonner (PNNL)

Craig Cameron (EPA)
Abdul Dada (BHI)
Linda Fassbender (PNNL)
Mark Freshley (PNNL)
Judit German-Heins (Nez Perce Tribe)
Jim Hanson (DOE-RL)
Wayne Martin (PNNL)
Pete Molton (PNNL)
Scott Petersen (BHI/TA)
Ed Thornton (PNNL)
Arlene Tortoso (DOE-RL)

Wrap-Up (Arlene Tortoso)

The next Subcon Subgroup meeting was to be held at 8:30 a.m. on February 8 in Room 1B-40 of the Bechtel Building. However, the meeting was subsequently postponed until March 7, same time, same room.